is diffused into neighboring ganglions, which are connected with other centripetal routes from the periphery. This would produce to consciousness the impression of contact at each of these points connected with these ganglion cells. In this manner, the author explains the case of two patients who, when brisk contact-impressions were produced on one leg, always felt it also in the other.

MM. Debove and Boudet, of Paris, *Archives de Neurologie*, i, p. 42, experimenting with a new apparatus, the myophone, invented by one of themselves, which gives the sound of the muscles in contraction and at rest, found a decided inequality in the tonicity of different groups of muscles in ataxics, which had begun to display the symptom of incoördination. It was not noticeable in those cases characterized only by the frequent pains of the incipient stages of the disease. They explain the incoördination of this disease by this lesion of tonicity, which in turn is accounted for by the disease of the posterior roots, as the section of these, experimentally, in animals, produces locomotor troubles referable to loss of muscular tonicity. They cannot, in those cases, be assimilated to those of ataxics, because in the latter we have only inequality of tonicity, not complete loss of tonus ; but the principle is the same in both. MM. Debove and Boudet notice briefly the theories of the incoördination in tabes : that of Tschiriew who attributed it to loss or diminution of muscular tonus ; that of Pierret, who considered it to be caused by limited muscular paralysis ; that of many authors, who have considered it due to loss of general sensibility; and after an analysis of the facts of the movements of ataxics, conclude that " the incoördination of tabetics is due to an unequal tonicity of their muscles, the effects of which are diminished by the maximum contraction of these muscles."

They do not refer to the idea largely held, and which seems to us rational, that the loss of the muscular sense has much to do with the incoördination. We are still inclined to attribute it, in part at least, to this deficiency.

FUNCTIONAL ISCHÆMIA OF THE BRAIN.—Prof. Ball, of Paris, read a paper, at the last meeting of the British Medical Association, on this subject, which is given in full in the *British Medical Journal* of October 30th. In it he relates and discusses three interesting cases, which may be summed up as follows : The first was a young man of good character, married, temperate, who, after giving way to a fit of passion, was suddenly struck deaf and dumb, with hemianæsthesia and slight motor paralysis on the left side. Speech was recovered in eighteen hours, but the other symptoms continued twenty-two days, suddenly disappearing after a few galvanic applications applied to the posterior part of the left forearm. The patient's health was previously good, but the year before he had been suddenly struck blind on the left side, and only recovered his vision after the lapse of a month. The intellectual faculties were always intact.

The second case was that of a cab-driver, æt. 33, strong, healthy, and of sober habits. He was married and of an easy, cheerful disposition. In December, 1879, he had an attack of acute rheumatism, and immediately after his recovery resumed his work, being at the time exposed to intense cold. On February 24th he had a severe attack of vertigo, and the next day came home in a peculiar condition, which still continued on his admission to the hospital, March 1st. He was in a sort of mental stupor, could not answer the simplest questions, but repeated them automatically; nor could he attend on himself in the simplest matters. He was completely hemianæsthetic and paretic on the right side. He gradually improved, however, without any specified treatment except an abortive attempt to use mercury and iodine, which had to be discontinued on account of the unpleasant effects of the latter, and on April 30th he was discharged, suffering only from a defect of memory. The motor power was recovered earlier than the sensory. There was afterward noticed a tendency to the recurrence of some of the symptons for a short time in the evening.

The third case was somewhat like the first. A man, aged 45, suddenly became aphasic in a fit of anger. The difficulty seemed to be due to a spasm of the tongue during the attempt to speak; there was no paralysis, and all other functions were normal. Recovery took place suddenly without treatment.

The explanation of all three cases given, is that there was a local vaso-motor ischæmia of those parts of the brain that have to do with the functions observed to be disturbed in each case. In none of the cases was there any heart disease discovered. It would have been easy to increase the number of facts, but it was thought important to exclude all possibility of the charge of hysteria, and therefore the cases selected to report were only those of strong, healthy laboring men, against whom this charge could not be raised. Prof. Ball deduces from these facts the following conclusions :

1. Spasmodic contraction of the brain-vessels may be produced by moral impressions, fear, anger, or grief, and also by the prolonged action of severe cold.
2. All the symptoms of organic injury of the brain may be created by functional ischæmia.
3. Mental disturbances of a peculiar kind, and especially lowering of intellectual power, as apart from positive insanity, may be the result of this process.
4. Spasmodic contraction of the brain-vessels, when once induced, may persist for a considerable length of time without producing structural changes in the nervous centres.
5. This morbid condition may, in certain cases, suddenly disappear, while it is not unreasonable to suppose that the converse may be equally true, and that the symptoms may culminate in rapid or even sudden death.

FATIGUE AS A CAUSE OF EPILEPSY.—Dr. B. Saloman, of Coblenz, *Deutsch. Med. Wochenschr.*, Nos. 34 and 35, as a frequent cause of the epileptic attacks sometimes observed in persons otherwise sound and without any hereditary or other predisposition to nervous disorder, suggests mental or physical overstrain, especially the latter. He claims the functions of the nervous centres may be interfered with by muscular over-exertion in several ways, viz. : 1, by the blood circulating in them containing an excess of carbonic acid, and a deficient quantity of oxygen ; 2, by the brain being inadequately supplied with oxygenated blood on account of the heart being unable to overcome sufficiently the increased resistance caused by the general muscular contraction ; and 3, by the heightened reflex irritability of the brain due to the continuous irritation of the sensory nerves passing through the contracted muscles.

Muscular activity consumes oxygen and causes formation of carbonic acid, which is ordinarily gotten rid of by increased action of the lungs. But when, as in marching soldiers, the chest is embarrassed by a heavy pack, and the abdomen compressed by the sword belt, this cannot be always effected even with increased frequency of respiration. The circulation of the brain is also interfered with in other ways, by the pressure of the cravat or stock, and these, together with the altered and abnormal con-